

# HANFORD: Tanks in Trouble

## UW Public Meeting



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# Ecology's Role at Hanford

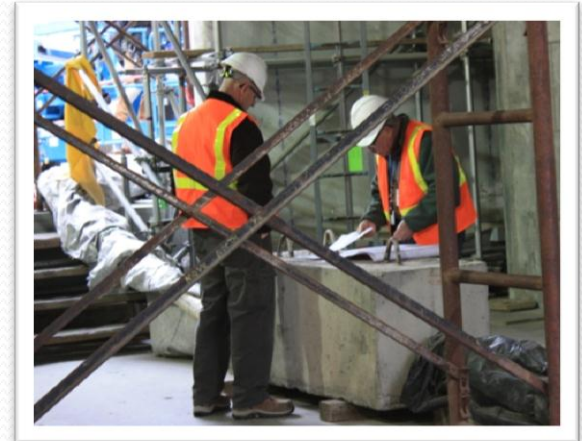
- Ensure that Hanford cleanup protects the Columbia River by following state laws to protect our air, land, and water
- The Tri-Party Agreement (TPA), signed in 1989 between Washington State, USDOE, and EPA, provides the legal framework for Hanford Site cleanup and schedules
- Ecology RCRA\* permit outlines conditions for treatment, storage, and disposal of chemically hazardous wastes
  - ✓ Management of dangerous and mixed wastes
  - ✓ Cleanup of spills, leaks and other contamination (non-radioactive)

*\*Resource Conservation & Recovery Act*



# How is Cleanup Work Done?

- USDOE plans the work
  - Regulatory agencies approve plans
- Contractors do work per work plans
  - Regulatory agencies and USDOE oversee work
- USDOE reports work
  - Regulatory agencies check report, modify recommendations, and may request further work
- All regulations have same goal:  
**protect human health & environment**





# Recent Tank Issues

- Single-shell tank review findings:
  - 6 leaking, 14 more under investigation for declining levels
  - 52 under investigation for precipitation entering (intrusion)
- Double-shell tank leaking between shells (annulus)
- The State believes additional tank space will be required to support continued retrievals, prepare for feeding the Waste Treatment Plant, and for emergency retrieval space.

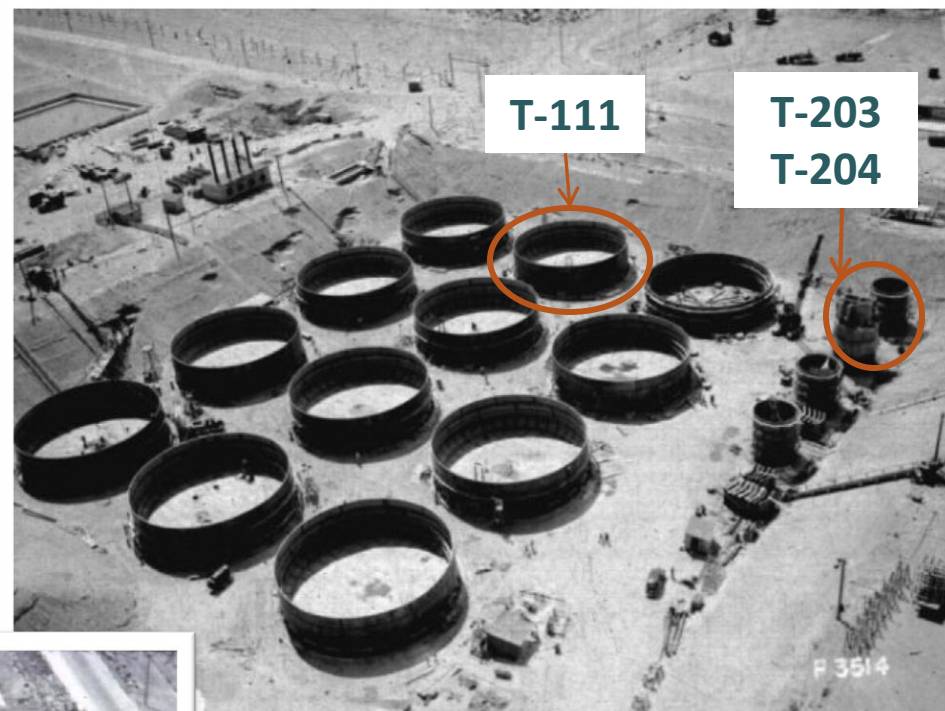




**Double-shell tanks  
under construction**



# Single-shell tanks under construction



*Above: T Tank Farm, 1944*

*Left: B Tank Farm, World War II*

*Not pictured: TY-105*



**B-203, B-204**

# **No immediate or near-term health risks**

- Underground tanks between 5–8 miles from the Columbia River and far from any residences or agricultural facilities
- No route from the leak to agricultural areas = no risk of food crop contamination
- Groundwater is ~200-300 feet below tanks, so current leaks will take decades to reach it
- Pre-existing Hanford groundwater contamination is actively remediated with a system of pump & treat facilities, keeping contamination from the river

**None of this mitigates the State's concerns.**

The discovery of leaking tanks underscores the importance of retrieving and treating this tank waste as quickly as possible to mitigate the chances for further releases to the environment.

# Single-Shell Tank Next Steps

- Independently analyze data that led USDOE headquarters to determine 6 SSTs are leaking
- Pursue sending TRU\* waste to WIPP\*\*
- Consider options to address leaks and mitigate releases to soil, for example:
  - Increase monitoring and sampling
  - Remove liquids with portable evaporator
  - Place interim barriers
  - Develop new waste retrieval technologies

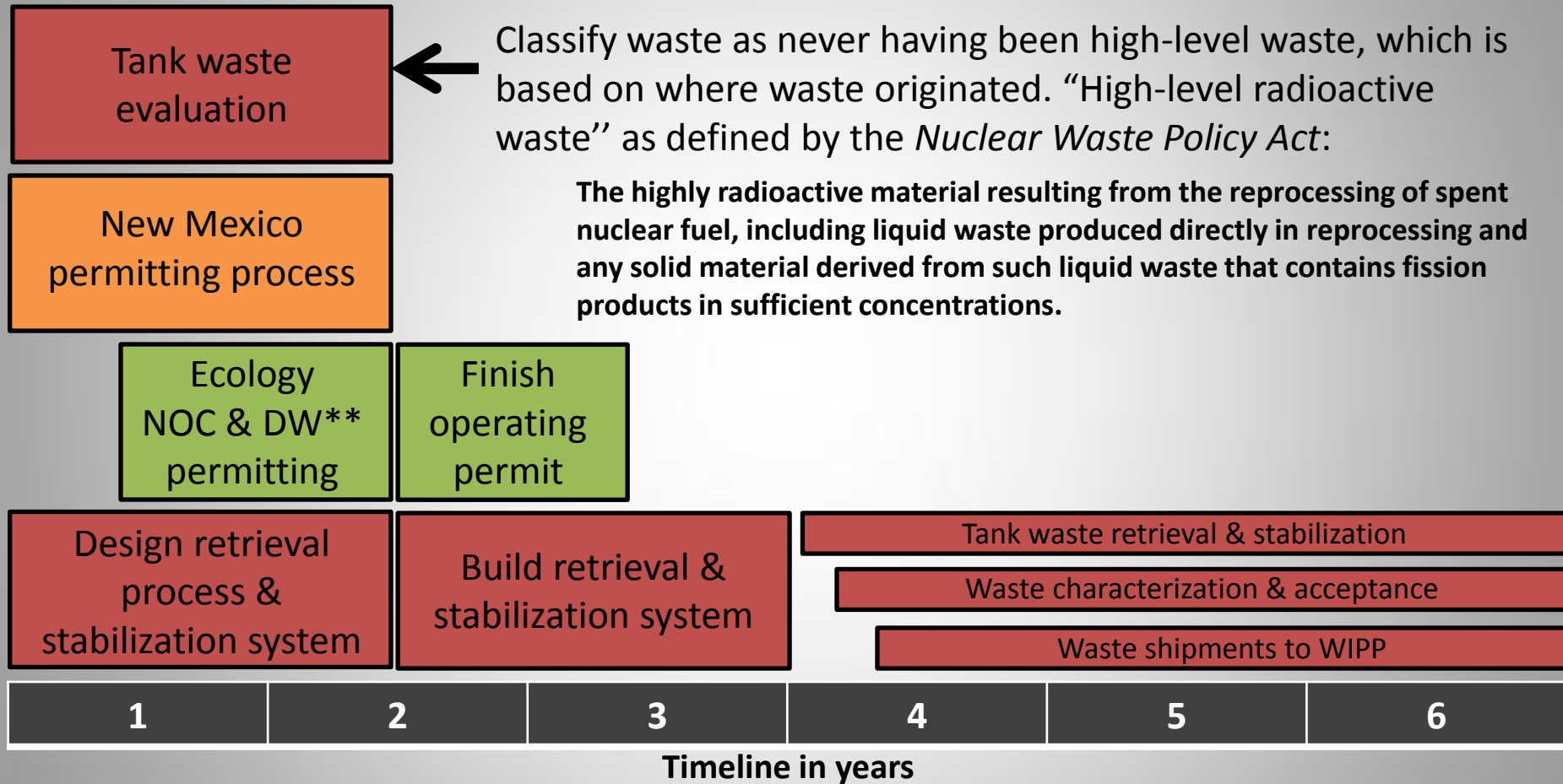


\* Transuranic

\*\* Waste Isolation Pilot Plant, New Mexico



# Timeline for delivery of Hanford tank waste to WIPP\*



← Classify waste as never having been high-level waste, which is based on where waste originated. “High-level radioactive waste” as defined by the *Nuclear Waste Policy Act*:

The highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations.



New Mexico process

Washington process

USDOE process

\*Individual timelines based on current information from USDOE and optimistic assumptions regarding parallel processes.

\*\*Notice of Construction & Dangerous Waste

# DST AY-102 Timeline & Next Steps

- 8/8/12 – USD OE notifies Ecology of potential leakage into AY-102 (liquid entering from outside tank)
- 10/22/12 – USD OE notifies Ecology that the tank is leaking from inner shell
- 10/23/12 – Ecology and USD OE agree to set up team to work through technical challenges
- 5/6/13 – USD OE sent Ecology letter committing to deliver plan to pump the tank **by June 14, 2013**

# State Enforcement

- Ecology issues orders or penalties for violation of Hazardous Waste Management Act (HWMA) requirements, including, but not limited to, in TPA (Administrative Authority)
- Can seek additional work with TPA to address:
  - Non-compliance
  - New information
  - Imminent and substantial endangerment
- Lawsuits by Washington Attorney General to enforce USDOE's legal requirements to:
  - Timely notify of releases to environment
  - Timely respond to tank leaks



# Tank Waste Treatment

## Policy issues

- 2010: Treatment start date delayed 8 years, after 3 false starts and 2 delays in the current plan, resulting in **21 years total delay**
- Budget shortfalls
- More delays may occur

## Technical issues

- Black cell design
- Erosion/corrosion
- Pulse jet mixers
- Particulate buildup
- Flammable gas

## Final waste disposition

- Low-activity waste: Integrated Disposal Facility at Hanford
- High-level waste: Deep geologic repository



*Above: \$12.3-billion vitrification plant Bechtel National, Inc., is constructing at Hanford*

# What can *you* do about Hanford?



Get informed!  
Stay informed!  
Inform others!



Get involved! Ecology ♥s students ...  
If you are interested in Hanford, contact us!

# How can *you* affect tank decisions?

- Contact Federal or State government elected officials, or government agency representatives
  - Communicate your values related to Hanford cleanup
- Attend a public meeting or hearing
  - Submit verbal or written comments on a specific, proposed decision about Hanford cleanup





# Comment with Confidence!

- Find contacts at government agencies before public comment periods start
- Comment early and often
- Team up with a public interest group, and coordinate your comments



*Seattle's Raging Grannies*

Adapted from *The Art of Commenting: How to Influence Environmental Decisionmaking with Effective Comments*, Mullin, 2000.

# Tips for Effective Comments

- Identify your objectives for a proposal
  - Support a particular outcome
  - Stop, delay, or minimize an action's impacts
- Frame your comments to support your specific objectives



Adapted from *The Art of Commenting: How to Influence Environmental Decisionmaking with Effective Comments*, Mullin, 2000.



# Always available online ...

Nuclear Waste website:  
[ecy.wa.gov/programs/nwp](http://ecy.wa.gov/programs/nwp)

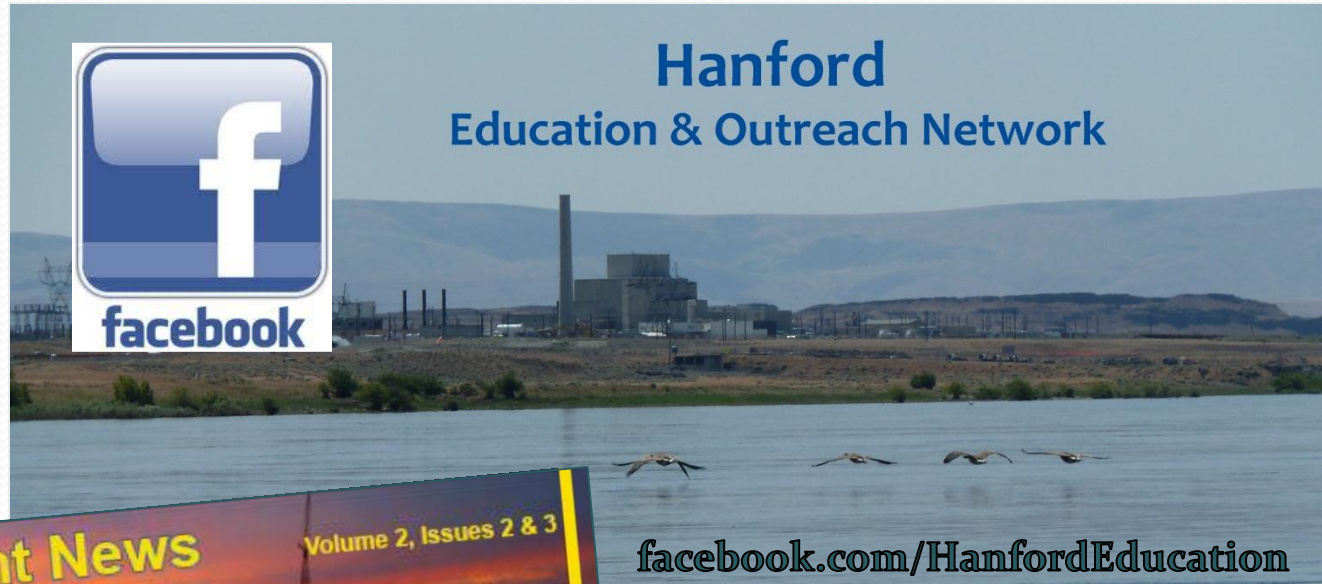


**ECOconnect**

[ecologywa.blogspot.com](http://ecologywa.blogspot.com)



## Hanford Education & Outreach Network



[facebook.com/HanfordEducation](https://facebook.com/HanfordEducation)



### In this double issue

- 1 Potential wear & tear in WTP piping; tanks causes concern
- 2 Erosion & corrosion at WTP: A timeline
- 3 Low-Activity Waste Facility receives new equipment
- 4 How can you influence WTP?
- 4 Environmental education journal features Ecology's Hanford outreach efforts
- 5 Glossary of bolded terms

### Contact us

Suzanne Dahl, Tank Waste Treatment Manager  
Melmas, Community Outreach, TWTN Editor

### Why it matters

The 586-square-mile Hanford Site is located in central Washington along the Columbia River. Hanford's mission included defense-related nuclear research, development, and weapons production activities from 1943 to 1987. During that time, Hanford operated a plutonium-production complex with nine nuclear reactors and associated processing facilities.

Today at Hanford, 177 underground storage tanks hold a total of 56 million gallons of dangerous waste. Some of these tanks have leaked, contributing to more than 70 square miles of contaminated groundwater currently under Hanford. This tainted groundwater threatens the Columbia River and all life that depends on it.

The U.S. Department of Energy and its contractor Bechtel National, Inc., are constructing the Tank Waste Treatment and Immobilization Plant (WTP) to prepare waste for long-term storage. The WTP will convert waste into a solid form.

**inheriting hanford**  
a hanford mentorship  
community

Contact Ecology anytime with  
questions or comments:

- [Hanford@ecy.wa.gov](mailto:Hanford@ecy.wa.gov)
- 800-321-2008



# SSTs in Question

Tank	Capacity	Current vol.	~ leak rate	Leaked before 2013?
B-203	55,000 gal	49,000 gal sludge 1,000 gal liquids	15 gal/yr	yes
B-204	55,000 gal	49,000 gal sludge 1,000 gal liquids	15 gal/yr	yes
T-111	530,000 gal	447,000 gal sludge	300 gal/yr	yes
T-203	55,000 gal	36,000 gal sludge	15 gal/yr	no
T-204	55,000 gal	36,000 gal sludge	15 gal/yr	no
TY-105	758,000 gal	231,000 gal sludge	300 gal/yr	yes

Hanford tanks vary in capacity from 55,000 to 1 million gallons.

# Regulatory Status of Hanford SSTs and DSTs

- SSTs were declared unfit for use in 2002
  - “In recognition of the inability to meet current regulatory leak integrity requirements, these tanks and ancillary systems should be considered not fit for use per 40 CFR 265.191.”
- DSTs are regulated under RCRA standards
  - It is not currently in the Hanford Permit, therefore:
  - It is under WAC 173-303-400(3) – Interim status standards for tank systems point to 40 CFR 265.196, which is essentially identical to WAC 173-303-640

# Regulations Applicable to Regulated Leaking Tanks

## WAC 173-303-400

- (3) Standards.
  - (a) Interim status standards are the standards set forth by the Environmental Protection Agency in 40 CFR Part 265 Section 265.19 of Subpart B, Subparts F through R, Subpart W, Subparts AA, BB, CC (including references to 40 CFR Parts 60, 61, and 63), DD, EE, and Appendix VI, which are incorporated by reference into this regulation (including, by reference, any EPA requirements specified in those subparts which are not otherwise explicitly described in this chapter), and:
    - (iii) WAC 173-303-640 (5)(d), for tanks; and
  - (b) For purposes of applying the interim status standards of 40 CFR Part 265 Subparts F through R, Subpart W, and Subparts AA, BB, CC, DD, and EE to the state of Washington facilities, the federal terms have (and in the case of the wording used in the financial instruments referenced in Subpart H of Part 265, must be replaced with) the following state of Washington meanings:
    - (i) "Regional administrator" means the "department" except for 40 C.F.R. Parts 270.2; 270.3; 270.5; 270.10 (e)(1),(2) and (4); 270.10 (f) and (g); 270.11 (a)(3); 270.14 (b)(20); 270.32 (b)(2); and 270.51;
    - (ii) "Hazardous" means "dangerous" except for Subparts AA, BB, CC, and DD. These subparts apply only to hazardous waste as defined in WAC 173-303-040;



# Regulations Applicable to Regulated Leaking Tanks

## 40 CFR 265.196

- **§ 265.196 Response to leaks or spills and disposition of leaking or unfit-for-use tank systems.**  
A tank system or secondary containment system from which there has been a leak or spill, or which is unfit for use, must be removed from service immediately, and the owner or operator must satisfy the following requirements:
  - (a) *Cessation of use; prevent flow or addition of wastes.* The owner or operator must immediately stop the flow of hazardous waste into the tank system or secondary containment system and inspect the system to determine the cause of the release.
  - (b) *Removal of waste from tank system or secondary containment system.*
    - (1) If the release was from the tank system, the owner or operator must, within 24 hours after detection of the leak or, if the owner or operator demonstrates that that is not possible, at the earliest practicable time remove as much of the waste as is necessary to prevent further release of hazardous waste to the environment and to allow inspection and repair of the tank system to be performed.
    - (2) If the release was to a secondary containment system, all released materials must be removed within 24 hours or in as timely a manner as is possible to prevent harm to human health and the environment.

# Regulations Applicable to Regulated Leaking Tanks

## 40 CFR 265.196

- (c) *Containment of visible releases to the environment.*
- (d) *Notifications, reports.*
- (1) **Any release to the environment, except as provided in paragraph (d)(2) of this section, must be reported to the Regional Administrator within 24 hours of detection.** If the release has been reported pursuant to 40 CFR part 302, that report will satisfy this requirement.
- (2) A leak or spill of hazardous waste that is:
  - (i) Less than or equal to a quantity of one (1) pound, and
  - (ii) Immediately contained and cleaned-up is exempted from the requirements of this paragraph.
- (3) Within 30 days of detection of a release to the environment, a report containing the following information must be submitted to the Regional Administrator:
  - (i) Likely route of migration of the release;
  - (ii) Characteristics of the surrounding soil (soil composition, geology, hydrogeology, climate);
  - (iii) Results of any monitoring or sampling conducted in connection with the release, (if available). If sampling or monitoring data relating to the release are not available within 30 days, these data must be submitted to the Regional Administrator as soon as they become available;
  - (iv) Proximity to downgradient drinking water, surface water, and population areas; and
  - (v) Description of response actions taken or planned.

# Regulations Applicable to Regulated Leaking Tanks

## 40 CFR 265.196

- (e) *Provision of secondary containment, repair, or closure.*
  - (1) Unless the owner or operator satisfies the requirements of paragraphs (e) (2) through (4) of this section, the tank system must be closed in accordance with § 265.197.
  - (3) If the cause of the release was a leak from the primary tank system into the secondary containment system, the system must be repaired prior to returning the tank system to service.
- (f) *Certification of major repairs.* If the owner/operator has repaired a tank system in accordance with paragraph (e) of this section, and the repair has been extensive (e.g., installation of an internal liner; repair of a ruptured primary containment or secondary containment vessel), the tank system must not be returned to service unless the owner/operator has obtained a certification by a qualified Professional Engineer in accordance with § 270.11(d) that the repaired system is capable of handling hazardous wastes without release for the intended life of the system. This certification is to be placed in the operating record and maintained until closure of the facility.



# Additional Tank Requirements

- SSTs: RPP-9937 “Leak Detection, Mitigation, and Monitoring”
  - TPA Milestone requirement
  - Identifies monitoring, and response to detected leaks in specific tanks
  - Acknowledges limitations to unfit-for-use tanks
- DSTs: HNF-3484, *Double-Shell Tank Emergency Pumping Guide*
  - Result of previous enforcement action on leak detection
  - Identifies response time constraints